

WE CLAIM:

1. A process for making an absorbent fibrous web composite, comprising the steps of:

providing a first superabsorbent polymer precursor composition;

providing a second superabsorbent polymer precursor composition capable of chemically reacting with the first superabsorbent polymer precursor composition upon contact;

providing a pre-formed fibrous web including a plurality of hydrophilic fibers;

adding the first superabsorbent polymer precursor composition to the fibrous web;

separately adding the second superabsorbent polymer precursor composition to the fibrous web, whereupon the second superabsorbent polymer precursor composition comes into contact with the first superabsorbent polymer precursor composition; and

chemically reacting the first and second superabsorbent polymer precursor compositions on or in the fibrous web to form a superabsorbent polymer.

2. The process of Claim 1, wherein the first and second superabsorbent polymer precursor compositions are separately added as microdroplets having diameters of about 10-1000 microns.

3. The process of Claim 2, wherein the microdroplets have diameters of about 50-500 microns.

4. The process of Claim 2, wherein the microdroplets have viscosities of about 5-1000 centipoise.

5. The process of Claim 2, wherein the microdroplets have viscosities of about 10-500 centipoise.

6. The process of Claim 2, wherein the microdroplets have viscosities of about 20-100 centipoise.

7. The process of Claim 1, wherein the first and second superabsorbent polymer precursor compositions are each applied by spraying.

8. The process of Claim 1, wherein the first and second superabsorbent polymer precursor compositions are each applied by printing.

9. The process of Claim 1, wherein the first and second superabsorbent polymer precursor compositions are each applied by embossing.

10. The process of Claim 1, wherein the first and second superabsorbent polymer precursor compositions are separately added in two different stages.

11. The process of Claim 1, wherein the first and second superabsorbent polymer precursor compositions are separately added in a single stage.

12. The process of Claim 1, wherein the first superabsorbent polymer precursor composition comprises a monomer and the second superabsorbent polymer precursor composition comprises a polymerization initiator.

13. The process of Claim 1, wherein the first and second superabsorbent polymer precursor compositions chemically react spontaneously upon contact with each other.

14. The process of Claim 1, wherein the nonwoven web further comprises a plurality of thermoplastic fibers.

15. The process of Claim 1, wherein the hydrophilic fibers comprise cellulose fibers.

16. The process of Claim 1, wherein the hydrophilic fibers comprise absorbent fibers.

17. The process of Claim 1, wherein the hydrophilic fibers comprise staple fibers.

18. A process for making an absorbent fibrous web composite, comprising the steps of:

providing a first superabsorbent polymer precursor composition including a monomer;

providing a second superabsorbent polymer precursor composition including a polymerization initiator;

providing a pre-formed fibrous web including a plurality of fibers;

adding the first superabsorbent polymer precursor composition to the fibrous web;

separately adding the second superabsorbent polymer precursor composition to the fibrous web, whereupon the second superabsorbent polymer precursor composition comes into contact with the first superabsorbent polymer precursor composition; and

chemically reacting the first and second superabsorbent polymer precursor compositions on or in the fibrous web to form a superabsorbent polymer.

19. The process of Claim 18, wherein the first and second superabsorbent polymer precursor compositions are separately added in two different stages.

20. The process of Claim 18, wherein the first and second superabsorbent polymer precursor compositions are separately added in a single stage.

21. The process of Claim 18, wherein the monomer comprises a compound selected from the group consisting of aliphatic unsaturated monocarboxylic acids and their salts, methacrylic acids and their salts, unsaturated dicarboxylic acids and their salts, and combinations thereof.

22. The process of Claim 18, wherein the monomer comprises a compound selected from the group consisting of acrylic acid and its salts, methacrylic acid and its salts, and combinations thereof.

23. The process of Claim 18, wherein the polymerization initiator comprises a redox system.

24. The process of Claim 23, wherein the redox system comprises a water-soluble redox system.

25. The process of Claim 23, wherein the redox system comprises an oxidizing radical generator and a reducing agent.

26. The process of Claim 23, wherein the oxidizing agent comprises a compound selected from peroxides, persulfates, permanganates, chlorites, hypochlorites, and combinations thereof.

27. The process of Claim 23, wherein the reducing agent comprises a compound selected from sulfites, ascorbic acid, alkaline metal salts, and combinations thereof.

28. A process for making an absorbent nonwoven web composite, comprising the steps of:

providing a pre-formed nonwoven web including about 25-100% by weight absorbent fibers and about 0-75% by weight thermoplastic fibers;

providing a first superabsorbent polymer precursor composition;

providing a second superabsorbent polymer precursor composition capable of chemically reacting with the first superabsorbent polymer precursor composition upon contact;

adding the first superabsorbent polymer precursor composition to the nonwoven web in a dropwise fashion;

separately adding the second superabsorbent polymer precursor composition to the nonwoven web in a dropwise fashion; and

chemically reacting the first and second superabsorbent polymer precursor compositions on or in the nonwoven web to form a superabsorbent polymer.

29. The process of Claim 28, wherein the first and second superabsorbent polymer precursor compositions are separately added as microdroplets having diameters of about 10-1000 microns.

30. The process of Claim 29, wherein the microdroplets have diameters of about 50-500 microns.

31. The process of Claim 28, wherein the precursor nonwoven web comprises about 50-100% by weight absorbent fibers and about 0-50% by weight thermoplastic fibers.

32. The process of Claim 28, wherein the precursor nonwoven web comprises about 60-90% by weight absorbent fibers and about 10-40% by weight thermoplastic fibers.